PATENT

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REMOTE SUPERVISION SYSTEM AND METHOD

Background of the Invention

The present invention pertains to a system and method for supervising and monitoring a plurality of people from a remote location, and more particularly to a new and improved system and method for using an integrated network of hardware and software to produce an interactive environment between a plurality of distinct active locations and a remote location, and to a new and improved system and method for providing assisted living services to persons with cognitive disabilities that greatly increases the independence of those disabled persons at a lower cost as a result of significantly increased productivity of a daily living supervisor, without compromising the quality and effectiveness of the supervision provided.

The modern philosophy for assisting adults with cognitive disabilities to a more independent lifestyle focuses heavily on inclusion, or integrating those adults into normal living environments. This has lead to a movement of these individuals to smaller and more geographically disbursed group living arrangements supported by public funding. Over the last 35 years, the institutional population of persons with cognitive and other developmental disabilities in the United States has declined steadily from a peak of 195,000 in 1967 to 50,000 in 2001. States have closed institutions in order to reallocate institutional funds to more individualized residential

alternatives in community and family settings. Between 1980 and the present, the number of community-based group homes and supervised apartments for persons with developmental disabilities in the United States increased tenfold. Nearly two-thirds of all persons with developmental disabilities service in out-of-home placements in the United States now live in homes and apartments that serve six or fewer individuals.

Demographic trends are also a driving force behind the increased demand for smaller, community residential services. As a result of advances in medical treatment, people with developmental disabilities are living longer. Twenty-five years ago, the average life span of a person with a mental disability was in the late 50s. Today, it is just a few years less than the average life span for a non-disabled adult. As a consequence, adults with developmental disabilities are outliving their caretaker parents at an increasing frequency. It is estimated that over one-quarter of all persons with developmental disabilities are presently living in a household with at least one family member 60 years of age or older.

All states face growing waiting lists for community residential or living services as a result of these trends. This exerts added pressure on government to expand living system supports. For example, in the State of Indiana, a waiting list of over 6,000 individual with developmental disabilities needing community support services existed in 1998. This was used as leverage to garner a supplemental appropriation of over $39 million in the state budget to address the needs of those on

the waiting list. Even with tax revenues on the decline, the Governor has requested an additional $50 million in his budget for this issue. Legislators on both sides of the aisle have voiced support for the initiative.

As this system of community services in small settings grows, it requires the input of more and more direct services staff. This work force resource has grown increasingly scarce. Population estimates through 2008 put the growth of the total U.S. labor force at about 1.2% per year. Limitations on government reimbursement rates for provision of community services makes it difficult for providers in this area to compete with other businesses for this scarce resource.

The current method for supporting adults with mild to moderate cognitive disabilities in a community-living environment relies on face-to-face contact between a paid staff person and the adults with cognitive disability. This contact occurs primarily in the disabled person's house or, more often, apartment. A basic living routine and associated tasks are established for the disabled person with that person's input, such as times to awaken, shower, prepare meals, go to work, etc. A direct services staff person then uses prompts to assist the disabled person the daily living routine, including some individual tasks associated with these routines. Most often, these are verbal prompts interspersed with visual cues. Visual cues may include gestures by the staff person or the use of visual aids, such as a picture book sequencing meal preparation activities. The staff person is physically present in the apartment when this prompting occurs.

This method of face-to-face and one-on-one support has not changed significantly since the inception of community-based services. As the number of these service sites multiply, so does the requirement for direct services staff. In order to accommodate the growth of these services, some method must be developed to greatly increase the productivity of direct services provided in these environments. One method already recognized and in use is telephone technology. Where a disabled person can be trained to call for staff assistance at non-critical time periods, such as during overnight hours, the staff person need not be on site in the apartment with the disabled person to provide oversight and necessary supervision. This productivity enhancement allows one staff person to be at a remote location and serve many different consumers at the same time.

Therefore, it is highly desirable to provide a new and improved method for providing remote supervision of a plurality of people at different locations at the same time by one person. It is also highly desirable to provide a new and improved method whereby one supervisor can, remotely, do the work currently done by four or more supervisors who must be physically present in each supervised location to affect the guided supervision of people in those locations.

It is also highly desirable to provide a new and improved method for remote supervision that improves staff productivity. It is also highly desirable to provide a new and improved method for remote supervision that frees the time of the remote

supervisor in order to allow the supervisor to direct supervision and oversight services to persons in other locations.

It is also highly desirable to provide a new and improved method for providing remote supervision of persons with cognitive disabilities living independently of each other. It is also highly desirable to provide a new and improved method for increasing the independence of persons with cognitive disabilities requiring assisted living services. It is also highly desirable to provide a new and improved method for providing remote supervision of people with cognitive disabilities living independently of each other requiring assisted living services which utilizes an integrated network of computer hardware and software that provides for an interactive environment between a plurality of persons living independently at spaced apart locations with a remote supervisor. It is also highly desirable to provide a new and improved method for providing improved remote supervision of a plurality of people at different locations living independently of each other with significantly less man hours.

It is also highly desirable to provide a new and improved method for providing remote supervision of several people with cognitive disabilities in different locations by a single remotely positioned supervisor in a society in which the number of persons needing such supervision is increasing and the number of skilled supervisors is decreasing.

It is therefore also highly desirable to provide a new and improved communication system that permits interactive communication between a remote supervisor and a plurality of people with cognitive disabilities at different locations living independently of each other. It is also highly desirable to provide a new and improved communication system that utilizes a plurality of interconnected audio, visual, and physical sensory displays, signals and prompts to supervise a plurality of persons at spaced remote locations. It is also highly desirable to provide a new and improved communication system with a means for effectively and efficiently effecting communication, for operating the plurality of displays, signals and prompts, and for collecting, organizing and accessing information to be exchanged between a remote supervisor location and a plurality of spaced active locations supervised thereby.

Finally, it is highly desirable to provide a new and improved method and system having all of the above identified features.

Summary of the Invention

It is therefore an object of the invention to provide a new and improved method for providing remote supervision of a plurality of people at different locations at the same time by one person.

It is also an object of the invention to provide a new and improved method whereby one supervisor can, remotely, do the work currently done by four or more

supervisors who must be physically present in each supervised location to affect the guided supervision of people in those locations.

It is also an object of the invention to provide a new and improved method for remote supervision that improves staff productivity.

It is also an object of the invention to provide a new and improved method for remote supervision that frees the time of the remote supervisor in order to allow the supervisor to direct supervision and oversight services to persons in other locations.

It is also an object of the invention to provide a new and improved method for providing remote supervision of persons with cognitive disabilities living independently of each other.

It is also an object of the invention to provide a new and improved method for increasing the independence of persons with cognitive disabilities requiring assisted living services.

It is also an object of the invention to provide a new and improved method for providing remote supervision of people with cognitive disabilities living independently of each other requiring assisted living services which utilizes an integrated network of computer hardware and software that provides for an interactive environment between a plurality of persons living independently at spaced apart locations with a remote supervisor.

It is also an object of the invention to provide a new and improved method for providing improved remote supervision of a plurality of people at different locations living independently of each other with significantly less man hours.

It is also an object of the invention to provide a new and improved method for providing remote supervision of several people with cognitive disabilities in different locations by a single remotely positioned supervisor in a society in which the number of persons needing such supervision is increasing and the number of skilled supervisors is decreasing.

It is also an object of the invention to provide a new and improved communication system that permits interactive communication between a remote supervisor and a plurality of people with cognitive disabilities at different locations living independently of each other.

It is also an object of the invention to provide a new and improved communication system that utilizes a plurality of interconnected audio, visual, and physical sensory displays, signals and prompts to supervise a plurality of persons at spaced remote locations.

It is also an object of the invention to provide a new and improved communication system with a means for effectively and efficiently effecting communication, for operating the plurality of displays, signals and prompts, and for collecting, organizing and accessing information to be exchanged between a remote supervisor location and a plurality of spaced active locations supervised thereby.

Finally, it is an object of the invention to provide a new and improved method and system having all of the above identified features.

In the broader aspects of the invention, there is a provided a new and improved method for supervising and monitoring people from a remote location comprising the use of a communication system that builds upon telecommunications connections, computer interfaces, and information management via the internet. Strategically placed web cams, microphones, speakers, and display monitors are operatively linked to computers and information management means, and are used to permit a person in a remote location to view and listen to people in a plurality of active locations to verbally or visually prompt responses to inquiries or directives. The people in the active locations may also interact via these same interconnections to the person at the remote location. Touch screen technology may be included for purposes of automated supervision of tasks performed to accomplish a particular routine by the people in the active locations. Safety devices, such as smoke detectors, carbon monoxide detectors and intrusion detectors, may also be installed to warn a remotely located supervisor, the police or fire departments, or emergency medical services.

Brief Description of the Drawings

The above mentioned and other features and objects of the invention and manner of attaining them will become more apparent and the invention itself will be

better understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings wherein:

Figure 1 is a diagrammatic illustration of the new and improved method for communicating between a remote location and a plurality of distinct active locations, showing connection of the remote location to the active locations via a communication system;

Figure 2 is a diagrammatic illustration of prompting multiple actions to be performed at an active location and acknowledgment of performance at that location;

Figure 3 is an illustration of an embodiment of a communication system between a remote supervision location and an active location;

Figure 4 is a diagrammatic illustration of a video system;

Figure 5 is a diagrammatic illustration of an audio system;

Figure 6 is a diagrammatic illustration of a touch screen system having an audio prompt for running a basic living routine in the proper order of steps;

Figure 7 is a diagrammatic illustration of a light system;

Figure 8 is a diagrammatic illustration of a safety system;

Figure 9 is a diagrammatic illustration of a means for activating and deactivating the communication system of the present invention; and

Figure 10 is a diagrammatic illustration of a switching mechanism of the communications system of the invention.

Description of Specific Embodiments

Figures 1 through 9 illustrate various aspects of the new and improved method for remote supervision and a communication system utilized thereby. Figures 1 and 2 illustrate the supervisory relation of a remote supervision location to a plurality of distinct active locations and the communicative steps included in effective and efficient supervision therebetween. Figures 3, 4 and 5 illustrates a communication system having a video system and an audio system which communicates sights and sounds from one or more interconnected rooms at an active location to a remote location, and vice versa. Figures 6 through 9 illustrate individual systems that may be included in any specific embodiment of the present invention.

Referring now to Figures 1 through 5, a communication system **1** for remote supervision is provided such that a person **11** at a remote location **10** can monitor and supervise one or more persons **13** in one or more rooms **12** at an active location **14**. In a specific embodiment, the communication system **1** utilizes visual and audio surveillance and the exchange of information between the locations in order to permit persons in either location to observe and communicate with one or more persons in the other location. Visual and audio surveillance may be accomplished by way of a video system **15** and an audio system **16**. The exchange of information may be accomplished by way of a plurality of multi-faceted telecommunications connections and a central information exchanging means **38**.

Referring now to Figure 2, a method for remote supervision of the present invention permits a person **11** at a remote location **10** to supervise the performance of actions or tasks performed by one or more persons **13** at one or more active locations **14**. In a specific embodiment, the actions or tasks, when performed properly and in order, comprise a complete routine, such as a daily living routine like preparing a meal. In other specific embodiments, the person **11** is an assisted living supervisor overseeing one or more persons **13** with mild to moderate cognitive disabilities in a community living environment, such as an apartment. In yet other specific embodiments, the person **11** assists persons **13** in multiple living environments located in multiple spaced apart locations.

In order for a person **13** to complete a routine, the supervisor **11** prompts the person **13** to perform the multiple actions required to complete the routine step-by-step, one action at a time, and in order. In a specific embodiment, the prompting is carried out using the communication system **1**. The supervisor **11** at the remote location **10** prompts **5** performance of the first action in a routine at one of the active locations **14**. The supervisor **11** then awaits acknowledgment **7** from the person **13** at the active location **14** that the action has been performed. In other specific embodiments, acknowledgment **7** by the person **13** comprises acknowledgment of receipt of the prompt **5**, but also further communication indicating that the person **13** requires assistance in performing the action prompted. In yet other specific

embodiments, acknowledgment **7** by the person **13** comprises communication indicating that the person **13** requires in-person assistance such as a physical visit by a supervisor or other assisted living staff person other than the supervisor **11** who is on-call for such visits in the geographic area where the active location is located.

If no acknowledgment **7** is received by supervisor **11** within an agreed upon period of time, supervisor **11** repeats the prompt **5** and again awaits acknowledgment **7** from the person **13** at the active location **14**. In a specific embodiment, the supervisor **11** repeats the prompt **5** until acknowledgment **7** is received. Once acknowledgment **7** is received, the supervisor **11** prompts **9** performance of a second action in a routine to be performed by the person **13** at the active location **14**. For each action in a routine to be performed by the person **13** at the active location **14**, the supervisor **11** prompts the performance of each and awaits acknowledgment thereof, repeating as described above if needed, until all actions in a given routine are completed.

In a specific embodiment, the communication system **1** allows the supervisor **11** to oversee the performance of actions by persons **13** in distinct active locations **14** independent of each other. In other specific embodiments, the supervisor **11** can, through the communication system **1**, oversee the independent performances of actions in distinct active locations **14** that take place during the same or approximately the same time period. In yet other specific embodiments, the

communication system **1** allows the supervisor **11** to oversee such independent performances of actions in three or more distinct active locations **14**, which performances may take place during the same or approximately the same time period at each distinct active location **14**.

In a specific embodiment, the communication system **1** permits the supervisor **11** to prompt the person **13** with audio prompts. In other specific embodiments, the communication system **1** permits the supervisor **11** to prompt the person **13** with visual prompts. In yet other specific embodiments, the communication system **1** permits the supervisor **11** to prompt the person **13** with physical sensory prompts. In yet other specific embodiments, the severity of the prompt **5, 9** from supervisor **11** can be controlled by the communication system **1** by volume, brightness, frequency of repetition, degree of physical sensitivity, and any other characteristic of the prompt that may be controlled to by the communication system **1** be indicative of severity.

Referring now to Figure 3, the communication system **1** comprises a video system **15** and an audio system **16**. The video system **15** comprises cameras **28, 30** and monitors **22, 32** in both locations that allow a person in either location to view a person in the other location. Cameras **30** are mounted in one or more of the interconnected rooms **12**. In a specific embodiment, a camera **30** is strategically located in a room **12** in a way that maximizes the view of the room through the camera. In other specific embodiments, each camera **30** is moveable in order to scan

the room **12**. Each such camera **30** is operatively linked to information exchanging means **38**. In a specific embodiment, the cameras **30** are first operatively connected to a first server **18** used for the particular active location **14**, which is then in communicative connection with the information exchanging means **38**. In a specific embodiment, the cameras **30** are operatively linked to the first server **18** using contemporary video cable connections between the camera and the first server. In other specific embodiments, the cameras **30** may be operatively linked to the first server **18** using wireless means for transmitting a signal from each camera **30** to the first server **18**.

The video system **15** further comprises at least one remote camera **28** mounted at the remote location **10**. In a specific embodiment, the remote camera **28** is strategically located at the remote location **10** in a way that maximizes the view of a person **11** at the remote location through the remote camera. The remote camera **28** is operatively linked to the information exchanging means **38.** In a specific embodiment, the remote cameras **28** are first operatively linked to a second server **20** used for the remote location **10**, which is then in communicative connection with the information exchanging means **38**. In a specific embodiment, the remote camera **28** is operatively linked to the second server **20** using contemporary video cable connections between the remote camera and the second server. In other specific embodiments, the remote camera **28** may be operatively linked to the second server

20 using wireless means for transmitting a signal from the remote camera to the second server.

Monitors **32** are placed in one or more of the interconnected rooms **12**. Each monitor **32** is operatively linked to the information exchanging means **38** or first to the first server **18**. In a specific embodiment, a monitor **32** is operatively linked to the first server **18** using contemporary video cable connections between the monitor and the first server. In other specific embodiments, a monitor **32** may be operatively linked to the first server **18** using wireless means for transmitting a signal from the first server to the monitor. A remote monitor **22** is placed at the remote location **10**. The remote monitor **22** is operatively linked to the information exchanging means **38** or first to the second server **20**. In a specific embodiment, the remote monitor **22** is operatively linked to the second server **20** using contemporary video cable connections between the remote monitor and the second server. In other specific embodiments, the remote monitor **22** may be operatively linked to the second server **20** using wireless means for transmitting a signal from the second server to the remote monitor.

In order for a person **11** at the remote location **10** to view images perceived by the cameras **30** in the rooms **12** at the active location **14**, and for persons **13** at the active locations **14** to view images of the remote location perceived by the remote camera **28**, the video signals generated by the cameras **30** and the remote camera **28**

are delivered to the remote monitor **22** and the monitors **32**, respectively, via the central information exchanging means **38**. In a specific embodiment, video signals perceived by the cameras **30** in the rooms **12** at the active location **14** are sent to a first server **18** which then delivers them to a second server **20** via the central information exchanging means **38**, and the second server **20** then delivers those signals to the remote monitor **22** for being converted to video images. In other specific embodiments, a person **13** in the rooms **12** at the active location **14** can view video images taken by the remote camera **28** at the remote location **10** as a result of video signals sent from the remote camera **28** to a second server **20** which delivers the video signals to a first server **18** via the central information exchanging means **38**, and the first server **18** sends the video signals to the monitors **32** for being converted to video images at the active location.

Referring now to Figure 5, the audio system **16** comprises speakers **26, 36** and microphones **24, 34** in both locations that allow a person in either location to audibly communicate with a person in the other location. Microphones **34** are placed in one or more of the interconnected rooms **12**. Each microphone **34** is operatively linked to the information exchanging means **38**. In a specific embodiment, the microphones **34** are first operatively linked to a first server **18**. In other specific embodiments, a microphone **34** is operatively linked to the first server **18** using contemporary audio cable connections between the microphone and the first server. In yet other specific

embodiments, a microphone **34** may be operatively linked to the first server **18** using wireless means for transmitting a signal from the microphone to the first server. The audio system **16** further comprises at least one remote microphone **24** placed at the remote location **10**. The remote microphone **24** is operatively linked to the information exchanging means **38**. In a specific embodiment, the remote microphone **24** is first operatively linked to a second server **20**. In a specific embodiment, the remote microphone **24** is operatively linked to a second server **20** using contemporary audio cable connections between the remote microphone and the second server. In other specific embodiments, the remote microphone **24** may be operatively linked to the second server **20** using wireless means for transmitting a signal from the remote microphone to the second server.

Speakers **36** are placed in one or more of the interconnected rooms **12**. Each speaker **36** is operatively linked to the information exchanging means **38**. In a specific embodiment, the speakers **36** are first operatively linked to a first server **18**. In a specific embodiment, a speaker **36** is operatively linked to the first server **18** using contemporary audio cable connections between the speaker and the first server. In other specific embodiments, a speaker **36** may be operatively linked to the first server **18** using wireless means for transmitting a signal from the first server to the speaker. The audio system **16** further comprises at least one remote speaker **26** placed at the remote location **10**. In a specific embodiment, the remote speaker **26**

is operatively linked to the information exchanging means **38**. In a specific embodiment, the remote speaker **26** is first operatively linked to a second server **20**. In other specific embodiments, the remote speaker **26** is operatively linked to the second server **20** using contemporary audio cable connections between the remote speaker and the second server. In yet other specific embodiments, the remote speaker **26** may be operatively linked to the second server **20** using wireless means for transmitting a signal from the second server to the remote speaker.

In order for a person **11** at the remote location **10** to hear sounds perceived by the microphones **34** in the rooms **12** at the active locations **14**, and for persons **13** at the active location **14** to hear sounds from the remote location **10** perceived by the remote microphone **24**, the audio signals generated by the microphones **34** and the remote microphone **24** are delivered to the remote speaker **26** and the speakers **36**, respectively, via the central information exchanging means **38**. In a specific embodiment, audio signals generated by the microphones **34** in the rooms **12** at the active location **14** are sent to a first server **18** which then delivers them to a second server **20** via the central information exchanging means **38**, and the second server **20** then delivers those signals to the remote speaker **26** for being converted to sound. In other specific embodiments, a person **13** in the rooms **12** at the active location **14** can hear sounds from the audio signals generated by the remote microphone **24** at the remote location **10** as a result of audio signals sent from the remote microphone **24**

to the second server **20** which delivers the audio signals to the first server **18** via the central information exchanging means **38**, and the first server **18** sends the audio signals to the speakers **36** for being converted to sound at the active location **14**.

A supervisor **11** may additionally use physical sensory signals to prompt or communicate with a person **13** at an active location **14.** In a specific embodiment, such physical sensory signals are provided by a pager **39** having vibratory notification capabilities. In other specific embodiments, the pager **39** may also have audible notification capabilities, such as beeping, to provide audio signal prompts. In yet other specific embodiments, the pager **39** is wirelessly operatively linked to the information exchanging means **38** and/or the first and second servers **18,20**.

Referring now to Figure 6, supervision by a person **11** at the remote location **10** of persons **13** in the rooms **12** at the active locations **14** is augmented by a means for automating the gathering of information from the active locations **14** and the processing and running of task-driven routines to be performed by persons **13** in the rooms **12**. In a specific embodiment, the means for automating such steps comprises a system of touch screens **40** operatively connected to the information exchanging means **38**. The touch screens may be activated by software **42** for generating the touch screen interface, managing the operability of the touch screens, and for directing the flow of information input to the touch screen or provided through the touch screen. In other specific embodiments, this software **42** is executed by the first

server **18** for use at the active location **14**. In yet other specific embodiments, this software **42** is additionally executed by the second server **20** for use at the remote location **10**. In yet other specific embodiments, touch screens **40** are placed in one or more rooms **12** at the active location **14** for use by the persons **13** therein. The touch screens **40** are operatively connected to the first server **18**. In a specific embodiment, the touch screens **40** are operatively connected to the first server **18** using appropriate cables. In other specific embodiments, the touch screens **40** are connected to the first server **18** using a wireless means for transmitting a signal between the touch screen and the first server. In yet other specific embodiments, the touch screen **40** is operatively connected to the first server **18** only at times required for downloading or uploading information between the touch screen and the first server. A display monitor **41** is placed at the remote location **10**, which display monitor is operatively connected to the second server **20**. Information input to the touch screen **40** and managed by the software **42** is accessible to a supervisor **11** at the remote location **10**. The first server **18** delivers the information to the second server **20** via the central information exchanging means **38**. From the remote location **10**, a person **11** may access and additionally manipulate the information through the display monitor **41**.

Information input through the touch screens **40** by persons **13** in rooms **12** at the active locations **14** is compiled by the software **42** and utilized in and adapted for

use with specific tasks comprising a general routine. The routine and its multiple actions or tasks are compiled and stored on the first server **18**. In other specific embodiments, the routine and its multiple actions or tasks are additionally compiled and stored on the second server **20**. Software **48** for sequencing a routine is executed by the first server **18**. In other specific embodiments, the sequencing software **48** is additionally executed by the second server **20**. In yet other specific embodiments, the sequencing software **48** is alternatively executed through the central information exchanging means **38**.

The sequencing software **48** utilizes the touch screens **40** in the rooms **12** to prompt persons **13** at the active locations **14** to perform tasks in the routine in the proper sequence. In other embodiments, the sequencing software **48** additionally utilizes audio signals sent to the speakers **36** of the audio system **16** to audibly prompt the persons **13** at the active location **14** to perform tasks in the given routine in the proper sequence. In a specific embodiment, at least one notice indicator **50** is placed in each room where a task in a routine is performed, which indicator **50** signals the sequencing software **48** of the first server **18** when activated by a person **13** at the active location **14** to acknowledge that the action has been completed by the person. In other specific embodiments, the notice indicator **50** is a portable mechanism comprising a button to be depressed to send a signal using a wireless

means to send the signal to the first server **18** to be received and acted upon by the sequencing software **48**.

In a specific embodiment, the audio prompts provided by the sequencing software **48** are repeated for each task after a certain amount of time prescribed by the sequencing software has passed, in the event that the notice indicator **50** has not sent a signal to the first server **18** in that amount of time. In other specific embodiments, the sequencing software **48** prescribes a limited number of repeated audio prompts, after which the sequencing software signals the person **11** at the remote location **10** through the display monitor **41** via the central information exchanging means **38** to prompt the person at the remote location to interact with the person **13** at the active location **14** regarding completion of the task required by the proper sequence of the routine being performed.

Referring now to Figure 7, supervision by a supervisor **11** at the remote location **10** of persons **13** at the active locations **14** is supplemented by prompts that focus the attention of persons at the active location on items within the rooms requiring their attention. In a specific embodiment, the supplemental prompt is provided by a controllable lighting system **52**. In other specific embodiments, the lighting system **52** comprises a plurality of lights **54** strategically mounted in one or more of the rooms **12**. In yet other specific embodiments, a means **56** for mechanically controlling the direction in which each light **54** is facing, for controlling

the brightness of the light, and for controlling a strobing function is connected to each light. The controlling means **56** is operatively linked to the first server **18** or to the information exchanging means **38**, and is controlled by a controller **58** located at the remote location **10** and operatively linked to the second server **20.** The supervisor **11** at the remote location **10** uses the controller **58** to send signals to the controlling means **56** via the central information exchanging means **38**. In a specific embodiment, the controlling means **56** is operatively linked to the first server **18** using a wireless means for transmitting a signal from the first server to the controlling means. In other specific embodiments, the controller **58** is operatively linked to the second server **20** using a wireless means for transmitting a signal from the controller to the second server. The signal sent from the controller **58** at the remote location **10** reaches the controlling means **56** via the central information exchanging means **38**. In a specific embodiment, the supervisor **11** at the remote location **10** uses the controller **58** to cause the light **54** to point to and light up a particular item in the room **12** that needs the attention of the persons **13** in the room. In other specific embodiments, the supervisor **11** uses the controller **58** to cause the light **54** to flash to get the attention fo the person **13.** In yet other specific embodiments, the brightness and the frequency of repetition of the flashing light **54** is indicative of the severity of the supervisor's attempts to prompt the person **13** for any particular purpose. Other systems for visually or audibly focusing the attention

of persons at the active location on items requiring their attention may also be used as appropriate and adequate for this purpose.

Referring now to Figure 8, the communications system **1** of the present invention is additionally supplemented by a safety system **60** for monitoring and reacting to hazards at the active locations 14. In a specific embodiment, the safety system **60** comprises one or more detection mechanisms operatively linked to the information exchanging means **38**. In yet other specific embodiments, the safety system is first operatively linked to the first server **18**. Software **66** may be utilized in the safety system **60** for monitoring the status of the mechanisms. In other specific embodiments, the detection mechanism comprises a smoke detector **62** for detecting smoke and fire hazards. In yet other specific embodiments, the detection mechanism comprises a carbon monoxide detector **64** for detecting high levels of carbon monoxide. In yet other specific embodiments, the detection mechanism comprises intrusion detectors. The monitoring software **66** may be executed by the information exchanging means **38** or by the first server **18**. In yet other specific embodiments, the monitoring software **66** may be executed additionally by the second server **20**. When a detection mechanism detects a threshold level that indicates the presence of a safety hazard, the mechanism sends a signal to the monitoring software **66**. In a specific embodiment, the monitoring software **66** sets off an alarm in the rooms **12** at the active location **14**. In other specific embodiments,

the monitoring software **66** sets off an alarm that causes the central information exchanging means **38** to send a signal to the local fire department **70**. In yet other specific embodiments, the monitoring software **66** sets off an alarm that causes a signal to be sent from the first server **18** via the information exchanging means **38** to the second server **20** to be perceived by the person **11** at the remote location **10** to notify that person of the safety hazard in the active location.

Referring now to Figure 9, the communication system **1** may be deactivated during anticipated times of non-use, such as overnight hours or other hours of inactivity at the active location. In a specific embodiment, a means for effecting activation and deactivation of the communication system **1** is placed at each location. In other specific embodiments, an emergency activation means **68** is placed in one or more of the rooms at the active location to cause immediate activation and communication with a supervisor **11** at the remote location **10** in the event the communication system **1** is deactivated.

In the communication system **1** for remote supervision of the present invention, information is exchanged between the remote location **10** and the active location **14** via the central information exchanging means **38**. In a specific embodiment, information is first collected and organized at each location by a server having computing capabilities. The information comprises video signals from the cameras **30** and the remote camera **28** converted to pictures and displayed by the

monitors **32** and the remote monitor **22**, audio signals generated by the microphones **34** and remote microphone **24** and converted to sound by the speakers **36** and the remote speakers **26**, information input to the touch screens **40** and display monitor **41** and provided through the touch screens and display monitor, and safety information regarding the presence of hazards at the active location **10**. In a specific embodiment, each of the first **18** and second servers **20** contain and execute specific software for computing, compiling, managing, manipulating, and otherwise utilizing, exploiting, and delivering particular information required for adequate remote supervision. In order to facilitate the exchange of information between each location, each of the first **18** and second servers **20** communicate through the central information exchanging means **38**. In a specific embodiment, the information exchanging means **38** comprises an internet web site accessed by both servers. In other specific embodiments, the web site provides means for inputting and storing information from each location. In yet other specific embodiments, the web site provides means for accessing and manipulating information input at one location from the other location. In yet other specific embodiments, the web site provides means for delivering information from one location to the other location. Access to the web site is protected by a password required to be entered by any person attempting to access the web site, and/or encryption.

In a specific embodiment, each of the servers **18, 20** is operatively connected to the central information exchanging means **38** via telecommunications connections.

In other specific embodiments, the servers **18, 20** are connected to the central information exchanging means **38** through DSL telephone lines. In yet other specific embodiments, the servers are connected to the central information exchanging means **38** through a cable modem system.

In specific embodiments, the use of a single monitor, microphone, speakers, touch screen, video camera and light actuator at the remote location **10** may require a switching mechanism to be installed between each of the active locations **14** and the remote location **10**. Whenever the active locations include multiple microphones, multiple speakers, multiple video cameras, multiple video monitors, multiple touch screens and light actuators and the remote location has a single video monitor, microphone, speaker, video camera, light actuator and touch screen, the central information exchanging means **38** and sequencing software **48** includes a switching mechanism **70** whereby the supervisor **11** at remote location **10** may selectively activate specific video monitors, microphones, speakers, video cameras, light actuators and touch screens at the active location **14**. The switching mechanism **70** is shown in Fig. 10 to include multiple identical input devices **72** connected to an analog multiplexer **74** interconnected between a serial to parallel interface **76** and a computer system connected to the remote location **10**. By this means, communication of the method disclosed herein may be positioned utilizing one or more input or output devices as selected by the remote supervisor **11**. In a specific

embodiment, the active user **13** and of the remote supervisor **11** may determine which input devices and which output devices are actuated at any one time.

By installing the remote supervision system of the present invention, a supervisor **11** may perform the method for supervising and monitoring persons located at one or more active locations **14**, each containing one or more rooms, from a remote location using visual and audio prompts or other prompts. In a specific embodiment, the method of supervision and monitoring is augmented by using an automated touch screen system. In yet other specific embodiments, the method of supervision and monitoring is supported by using a supplemental visual prompting system, such as a light system **52**. In yet other specific embodiments, the method of supervision and monitoring is additionally supplemented by a safety monitoring system **60**. The method of supervision and monitoring with automated augmentation and supplementation permits one person to remotely supervise more than one active location **14** from a single remote location **10**.

The following example illustrates a specific embodiment of the present invention.

Example 1

Strategically placed video and audio systems, comprising web cams, microphones, speakers and display monitors in a community living apartment site for supervision of adults with cognitive disabilities permit a staff person located at a remote location to be electronically linked to the rooms at that site. Transmission of

surveillance information at the site, generated from the video and audio systems, occurs via a DSL telephone line or cable modem system.

The web cams are placed in the living room and kitchen of each apartment housing a disabled person. Speakers and microphones are disbursed throughout the same areas, as well as in other rooms at the site. Display and touch screen monitors are located in the apartment in strategic locations convenient for the disabled person to see and use while engaging in activities of daily living. All of these devices are linked to a computer that, in turn, is connected to the DSL line or cable modem system.

At the remote location, a web cam is trained on a single staff person simultaneously. This staff person also has immediate access to a microphone linked to the speakers at the site. The microphones at the site are linked to speakers audible to the staff person at the remote location. The staff persons's computer is also connected to a DSL line or a cable modem system to enable communication between the staff person and the disabled person via a secure web site, which manages the exchange of surveillance information between the site and the remote location and which stores and controls information inputted by both the staff person and the disabled person. The web site is secured by means of a password and/or encryption so that the public does not have access to it.

Through these devices, the disabled person can communicate with and receive supportive prompts from the staff person at the remote location. Because of the

video and audio systems, the disabled person is able to both hear the staff person and see him. The remote staff person can provide the same verbal prompts and feedback statements to the disabled person as would be given by a direct services staff person on a face-to-face basis. This includes such things as awakening the disabled person, reminding them to take a shower, asking them if they have performed daily hygiene tasks, observing and giving feedback on the disabled person's selection of clothes, giving verbal or visual assistance during meal preparation activities, helping them plan a daily schedule, and prompting them to leave for work or to catch the bus on time. The electronic transmission of positive feedback from the staff person reinforces desired behavior just as in face-to-face situations. This feedback is both verbal and visual through use of the speakers and monitors.

Special software and touch screen technology permit the remote supervisor to assist the disabled person through more complex home living or community living tasks. This includes the preparation of weekly menus, specific meals, planning weekly social activities, and cleaning schedules. The software and touch screen technology is adapted from the current use of picture-books with the cognitively disabled for this purpose by direct services staff persons. With picture-books, the staff person obtains the disabled person's verbal preferences using a picture-book showing choices for different meals. The preferences are then recorded and a menu plan prepared. Picture-books also assist with performing routines, such as meal preparation, by showing pictures sequenced in accordance with the tasks of the

routine. In the present invention, touch screen technology with the appropriately customized software automates this process, for any number of routines.

The customized software is run by the computer at the site and controls the touch screen technology also linked to that computer. The touch screen monitors may be full size or as small as a Palm Pilot® or other similar hand-held device with touch screen capabilities, with a hot-sync option for downloading information to the on-site computer. The use of a Palm Pilot® type device allows for greater portability about the community living environment. As used for food and menu preparation, the menu possibilities are represented on the touch screen and the disabled person makes a selection for each meal by pressing the desired item. The software then automatically compiles the selections into a menu plan, complete with itemized lists of ingredients. Once the meal is chosen, its preparation is highly automated, as well. Visual tasks associated with preparation of a particular meal are automatically displayed by the software application on the touch screen in the proper sequence. Automated verbal prompts are also built into the software program as a supplement to the visual cues offered on the touch screen. The automated verbal prompts are broadcast over the speakers at the site, or integrated into the touch screen. The staff person is relegated to oversight during these complex activities, rather than active involvement.

Verbal prompts associated with the general daily living routines of each disabled person are also automated in the touch screen technology used in this

system. Through planning discussions with each disabled person, the preferences for their daily routine are determined, just as for menu planning. This includes such things as the time they want to wake up in the morning, whether they prefer to shower before or after breakfast or in the evening before retiring, times they need to leave for work, when they prefer to have meals, and times when they must take medication. In each daily living routine are tasks that need to be performed in sequence, which the disabled person often has difficulty remembering. Once the disabled person's preferences are collected regarding each routine, they are inputted to the customized software on the on-site computer. Automated verbal prompts related to each routine task are then scheduled for broadcast over the speakers in the apartment at the time each routine is run. As a key task in each routine is completed in sequence, the disabled person is verbally prompted to press a feedback button located in each room at the site. These buttons may be wireless transmission devices that send a feedback signal to the computer at the site. Once the signal is received, the special software records that task as complete and moves along to the next key task in the routine. If the signal is not received, the software sends another verbal prompt for the disabled person to complete the task or press the button if they have completed the task. If the software fails to receive this feedback response after a prescribed time, the software sends an alert to the staff person at the remote location. The staff person then electronically inquires about the status of the disabled person and whether they need help completing the task.

Other visual prompts are also adapted electronically. A light source supplants the gestural cues often given by direct services staff persons in face-to-face situations, such as meal preparation activities. The light may be manipulated to focus on a particular object by the staff person, using a controller at the remote location, when the disabled person does not respond to a verbal prompt, thus directing their attention to the item.

The advanced features of the new and improved system additionally ensure safety in each living environment as well. Smoke **62** and carbon monoxide **64** detectors are electronically linked to the on site computer **18**. A software program constantly monitors this safety equipment. In the event of an alert, the remote staff person, as well as the fire department **70**, are notified immediately.

The communication system may be shut down by switch **74** during non-intervention times, such as during sleeping hours. However, the disabled person can still use the system in the event of emergencies. A panic button **72** is available at the site to provide immediate contact with the remote staff person. When pushed, this button automatically activates the communication system.

Example 2

Utilizing the communications system of the invention in the manner described in Example 1, supervisor **11** at the remote location **10** would activate the microphone, speaker **36**, video monitor **32**, video camera **30** and touch screen **40** with active locations **14** and lead the active person **13** through specific routines. In performing

the routine of washing dishes, specific activities would be set forth on the monitor with pictures showing someone doing the particular activity, the active person **13** would be prompted to do the activity shown on the monitor by any one or more of the variety of means disclosed until the activity was completed. The video monitor **32** would then show the next activity of the routine and the prompting would be repeated until that activity was completed, and so on. In this manner, the entire routine would be prompted and supervised and completed in accordance with the method of the invention. The specific activities of a dishwashing routine would include the following:

Pick up the kitchen garbage container

Go to the kitchen sink

Put the garbage container on the floor next to the sink

Scrape excess food off each dirty plate into garbage container

Put all dirty dishes in one of the two sinks

Push the faucet over the empty sink

Turn on the water

Test the water with hand to see if it is warm

Turn faucet knob for more hot/cold water until it is running warm

Open cabinet door under sink

Take out the rubber gloves

Put on the rubber gloves

Take out rubber dish tub from the cabinet under sink

Put rubber tub in sink under the running water

Close kitchen cabinet

Pick up dish soap at edge of sink

Put one squirt of soap into rubber tub

When tub fills to top, push faucet to other sink with dirty dishes

Take dirty dish from other sink and put in rubber tub

Pick up sponge from edge of sink and dunk in soapy water

Pick up dish from tub with other hand

Wipe all sides of dirty dish with soapy sponge

Put down sponge into tub

Rinse soapy dish under running water

Put clean dish in dish rack beside sink to dry

The monitoring of each of these activities of the dishwashing routine would be used with a person **13** who had little skill in this particular task and who needed maximum guidance. Some of the prompts may be eliminated if the cognitively disabled consumer **13** had more skill in this particular area. A few general prompts would be needed to get the more highly skilled consumer through the entire routine. The training goal would be to get the cognitively disabled consumer **13** to a point where they would go through the whole routine of the steps above following one general

prompt to "wash the dishes," with the supervisor being able to stop the consumer and re-start the consumer appropriately when the consumer deviated from the routine.

The new and improved method for remote supervision allows the same staff person to serve a plurality of cognitively disabled consumers in four or more different apartments at the same time. This is achieved through the use of web server software, allowing the monitor for the staff person to be divided into quadrants. Each quadrant would be a visual and auditory link to a different apartment where one or more disabled persons live. In this way, one staff person could do the work currently done by four or more staff who must be physically present in each apartment to effect guided supervision of the disabled persons.

The new and improved method of the present invention further improves staff productivity. For example, disabled persons' choices for menu or social planning made with a touch screen would be automatically recorded and compiled into a weekly meal menu or social activity plan. This can be displayed for the disabled person at their discretion at the touch screen. Disabled persons could be taught to independently access this information, or request assistance in assessing it from the remote supervisor.

The new and improved method of the present invention also frees the remote guidance supervisor's time, allowing the supervisor to direct supervision and oversight of additional disabled persons in other community living settings. This one

staff person might then be able to cover the living arrangements of six to eight or more disabled persons.

The new and improved method of the present invention provides capabilities for remote supervision of persons with cognitive disabilities living independently of each other. The new and improved method also increasing the independence of persons with cognitive disabilities requiring assisted living services. The new and improved method additionally provides remote supervision of people with cognitive disabilities living independently of each other requiring assisted living services by utilizing an integrated network of computer hardware and software that provides for an interactive environment between a plurality of persons living independently in remote locations with a separately living supervisor. The new and improved method also provides improved remote supervision of a plurality of people at different locations living independently of each other with significantly less man hours. Moreover, the new and improved method provides remote supervision of more people with less supervisors.

The new and improved method of the present invention provides remote supervision of several people in different locations by a single remotely positioned supervisor in a society in which the number of persons needing such supervision is increasing and the number of skilled supervisors is decreasing.

The new and improved system of the present invention provides a new and improved communication system that permits interactive communication between

a remote supervisor and a plurality of people at different locations living independently of each other. The new and improved communication system of the present invention utilizes a plurality of interconnected audio, visual, and physical sensory displays, signals and prompts. The new and improved communication system of the present invention also comprises a means for effectively and efficiently effecting such communication, for operating the plurality of displays, signals and prompts, and for collecting, organizing and accessing information to be exchanged between the remote location and the different active locations supervised thereby.

Finally, the new and improved method and system for remote supervision provides all of the above identified features.

While a specific embodiment of the invention has been shown and described herein for purposes of illustration, the protection afforded by any patent which may issue on this application is not strictly limited to the disclosed embodiment; but rather extends to all structures and arrangements which fall fairly within the scope of the claims which are appended hereto: